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Subchapter 5. Electrical Safety Orders
Group 1. Low-Voltage Electrical Safety Orders
Article 2. Administration

§2305.2. Application.
*****
(b) Extent of application.
*****
(4) Requirements applicable only to installations made after May 5, 2008.
The following requirements apply only to electrical installations and utilization equipment installed after May 5, 2008:
Sec. 2340.16(d)(1) - Work Space About Electric Equipment.
Sec. 2340.16(g) - Work Space About Electric Equipment.
Sec. 2340.22(e) - Identification of Equipment - Capable of Accepting a Lock.
Sec. 2340.22(f) - Identification of Equipment - Marking for Series Combination Ratings.
Sec. 2360.1 - Identification of Multiwire Branch Circuits.
Sec. 2360.3 - Ground-Fault Circuit Interrupter Protection for Personnel - General Industry.
Sec. 2395.6 - Portable and Vehicle-Mounted Generators.
Sec. 2480.7(b) - Connection of Switches.
Sec. 2480.9(b) - Snap Switches.
Sec. 2560.2(c) - Electric Signs and Outline Lighting -Disconnecting Means.
Sec. 2562.2(c) - Elevators, Dumbwaiters, Escalators, Moving Walks, Wheelchair Lifts, and Stairway Chair Lifts - Disconnecting Means - Operation.
Sec. 2562.2(d) - Elevators, Dumbwaiters, Escalators, Moving Walks, Wheelchair Lifts, and Stairway Chair Lifts - Disconnecting Means - Location.
Sec. 2562.3 - Identification and Signs.
Sec. 2562.4 - Single-Car and Multi-Car Installations.
2569.5(c) - Swimming Pools, Fountains, and Similar Installations - Receptacles.
Sec. 2571.30 - Emergency Power Systems - Signs.
Article 84. Carnivals, Circuses, Fairs, and Similar Events
Sec. 2585.3 - Class 1, Class 2, and Class 3 Remote Control, Signaling, and Power-Limited Circuits - Separation From Conductors of Other Circuits.
Article 88. Solar Photovoltaic Systems
*****
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Article 4. Requirements for Electrical Installations

§2340.12. Mechanical Execution of Work.
Electric equipment shall be installed in a neat and workmanlike manner.
(a) Unused openings in boxes, raceways, auxiliary gutters, cabinets, fittings, equipment cases, or housings shall be effectively closed to afford protection substantially equivalent to the wall of the equipment.
*****
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Article 4. Requirements for Electrical Installations

§2340.16. Work Space About Electric Equipment.
(a) Space about electric equipment.
Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.
(b) Work Space. Working space for equipment likely to require examination, adjustment, servicing, or maintenance while energized shall comply with the following dimensions, except as required or permitted elsewhere in these Orders.
(1) Depth. The depth of the working space in the direction of access to live parts shall not be less than indicated in Table 2340.16 unless permitted elsewhere in these ~~o~~Orders.
Distances shall be measured from the live parts if they are exposed or from the enclosure front or opening if they are enclosed.
(2) Width. In addition to the dimensions of depth shown in Table 2340.16, the width of the workspace in front of the electric equipment shall not be less than the width of the equipment or 30 inches, whichever is greater.
~~(A) Concrete, brick, or tile walls shall be considered as grounded.~~
~~(B)~~ In all cases, the workspace shall be adequate to permit at least a 90 degree opening of equipment doors or hinged panels.
(3) Height. The work space shall be clear and extend from the grade, floor, or platform to the height required by subsection (f) of this section. However, other equipment associated with the electrical installation and located above or below the electric equipment may extend not more than 6 in. (153 mm) beyond the front of the electric equipment.

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Table 2340.16. Minimum Depth of Clear Working Space at Electrical Equipment, 600 V or Less

Nominal Voltage to Ground	Minimum Clear Distance					
	Condition 1		Condition 2		Condition 3	
	Feet	Meters	Feet	Meters	Feet	Meters
0-150	3*	0.9	3*	0.9	3	0.9
151-600	3*	0.9	3.5	1.0	4	1.2

Notes to Table 2340.16:
Where the "Conditions" are as follows:
Condition 1-Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at 300 volts or less shall not be considered live parts.
Condition 2-Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile surfaces shall be considered as grounded surfaces.
Condition 3 -Exposed live parts on both sides of the work space (not guarded as provided in Condition (1)) with the operator between.
EXCEPTIONS:
*1. Minimum clear distances may be 2.5 ft. (0.7 m) for installations built before April 16, 1981.
2. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back.
3. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 in. (762 mm) horizontally shall be provided.
*****
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Subchapter 5. Electrical Safety Orders
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Article 6. Branch Circuits

§2360.3. Ground-Fault Circuit Interrupter Protection for Personnel - General Industry.
*****

(b) The following requirements apply to temporary wiring installations that are used during maintenance, remodeling, or repair of buildings, structures, or equipment or during similar ~~construction-like~~ activities.

(1) All 120-volt (nominal), single-phase, 15-, 20-, and 30-ampere receptacle outlets that are not part of the permanent wiring of the building or structure and that are in use by personnel shall have ground-fault circuit-interrupter protection for personnel.

NOTE 1 to subsection (b)(1): A cord connector on an extension cord set is considered to be a receptacle outlet if the cord set is used for temporary electric power.

NOTE 2 to subsection (b)(1): Cord sets and devices incorporating the required ground-fault circuit-interrupter that are connected to the receptacle closest to the source of power are acceptable forms of protection.

(2) Receptacles other than 120 volt (nominal), single-phase, 15-, 20-, and 30- ampere receptacles that are not part of the permanent wiring of the building or structure and that are in use by personnel shall have ground-fault circuit-interrupter protection for personnel.

(3) Where the ground-fault circuit-interrupter protection required by subsection (b)(2) of this section is not available for receptacles other than 120-volt (nominal), single-phase, 15-, 20-, and 30-ampere, the employer shall establish and implement an assured equipment grounding conductor program covering cord sets, receptacles that are not a part of the building or structure, and equipment connected by cord and plug that are available for use or used by employees on those receptacles. This program shall comply with the following requirements:
*****

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Article 13. Temporary Wiring

§2405.4. Ground-Fault Circuit Protection – Construction Site.
(a) General. For purposes of this Section, a construction site is a place of employment where erection, demolition, ~~modification,~~ alteration or excavation is being performed on a building, structure or underground facility, other than mining.
(b) Construction Sites. To protect employees on construction sites, the employer shall use either or both ground-fault circuit interrupters as specified in Subsection (c) of this Section or an assured equipment grounding conductor program as specified in Subsection (d) of this Section. These requirements are in addition to any other requirements for equipment grounding conductors.
~~Exception: An individual cord set, supplied from a receptacle on a 15- or 20- ampere branch circuit which is part of the permanent wiring of that building or structure, shall not be required to comply with Section 2405.4(c) or (d).~~
(c) Ground-Fault Circuit Interrupters. All 120-volt, AC, single-phase, 15- and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single phase portable or vehicle-mounted generator rated not more than 5 KW, where the circuit conductors of the generator are insulated from the generator frame and all their grounded surfaces, need not be protected with ground-fault circuit interrupters.
Feeders supplying 15- and 20-ampere receptacle branch circuits shall be permitted to be protected by a ground-fault circuit interrupter approved for the purpose in lieu of the above provisions.
(d) Assured Equipment Grounding Conductor Program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all ~~120-volt, AC, single-phase,~~ cord sets, receptacles which are not a part of the permanent wiring of the building or structure and equipment connected by cord and plug, which are <u>available for use or</u> used by employees. This program shall comply with the following minimum requirements:
(1) A written description of the program, including the specific procedures adopted by the employer shall be available at the job site for inspection and copying by the Division of Occupational Safety and Health and any affected employee.
(2) The employer shall designate one or more qualified persons as defined in Section 2300 to implement the program.
(3) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug including these which are not required to be grounded, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as, deformed or missing pins or insulation damage, and for

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indication of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(4) The following tests shall be performed on all cord sets and receptacles which are not a part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded:

NOTE: Double-insulated tools or other similar equipment are not required to be grounded. See Section 2395.45 EXCEPTION 2 ~~(d)(5)~~.

*****

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Subchapter 5. Electrical Safety Orders
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Article 45. Cabinets, Boxes, and Fittings

§2473.1. Conductors Entering Boxes, Cabinets, or Fittings.
(a) Conductors entering cutout boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed.
~~(b) Unused openings in cabinets, boxes, and fittings shall be effectively closed~~
(b) ~~(c)~~ Where cable is used, each cable shall be secured to the cabinet, cutout box, or meter socket enclosure. However, where cable with an entirely nonmetallic sheath enters the top of a surface-mounted enclosure through one or more nonflexible raceways not less than 18 in. (457 mm) or more than 10 feet (3.05 m) in length, the cable need not be secured to the cabinet, box, or enclosure provided all of the following conditions are met:
(1) Each cable is fastened within 12 in. (305 mm) of the outer end of the raceway, measured along the sheath;
(2) The raceway extends directly above the enclosure and does not penetrate a structural ceiling;
(3) A fitting is provided on each end of the raceway to protect the cable from abrasion, and the fittings remain accessible after installation;
(4) The raceway is sealed or plugged at the outer end using approved means so as to prevent access to the enclosure through the raceway;
(5) The cable sheath is continuous through the raceway and extends into the enclosure not less than 0.25 in. (6.35 mm) beyond the fitting;
(6) The raceway is fastened at its outer end and at other points as necessary; and
(7) Where installed as conduit or tubing, the allowable cable fill does not exceed that permitted for complete conduit or tubing systems.
NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Article 58. Capacitors

§2534.8. Disconnecting Means.

~~(a)~~ A disconnecting means shall be provided in each ungrounded conductor for each capacitor bank~~.~~ and shall meet the following requirements:

~~EXCEPTION: Where a capacitor is connected on the load side of a motor-running overcurrent device.~~

(a) ~~(b)~~ The disconnecting means shall ~~not be required to~~ open all ungrounded conductors simultaneously.

(b) ~~(c)~~ The disconnecting means shall be permitted to disconnect the capacitor from the line as a regular operating procedure.

(c) ~~(d)~~ The rating of the disconnecting means shall not be less than 135 percent of the rated current of the capacitor.

EXCEPTION: A separate disconnecting means shall not be required where a capacitor is connected on the load side of a motor controller.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.